

*Program*

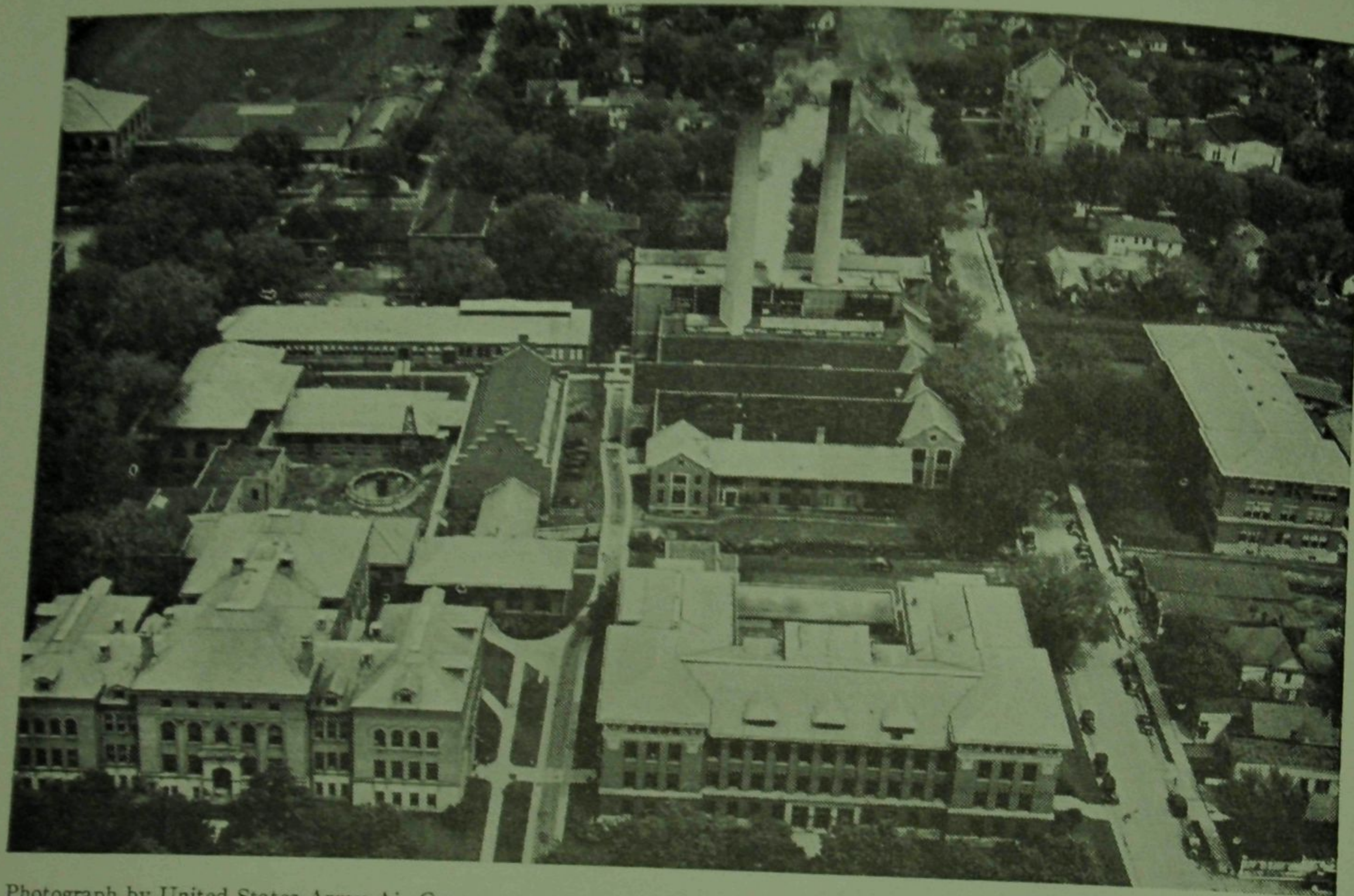
-

# THE ILLINOIS STUDENT ENGINEERING EXHIBIT

APRIL 4-5, 1941

PRESENTED BY THE COLLEGE OF ENGINEERING  
UNIVERSITY OF ILLINOIS





Photograph by United States Army Air Corps

## Welcome

The students and the faculty of the College of Engineering give you a hearty welcome to this exhibition of the facilities of the College. The laboratories will be in operation and various tests and demonstrations will be explained. We hope that you will see as much as possible of the exhibition and carry away a clearer impression of the many activities included under engineering.

M. L. ENGER  
Dean, College of Engineering

# THE ILLINOIS STUDENT ENGINEERING EXHIBIT

## ENGINEERING HALL

**STRUCTURAL ENGINEERING:** Motion pictures of the Tacoma Narrows Bridge collapse with a discussion of suspension bridge failures with the use of models.

**SURVEYING:** Surveying instruments and related equipment with a demonstration of the laying out of a spiral curve east of Engineering Hall.

**HIGHWAY ENGINEERING:** Models of the Pennsylvania turnpike, superhighways of the future, and a cross-section of a bituminous roadway. Demonstration of a grade separator with a working model. An expansion joint cutter will also be in operation north of the east entrance.

**HYDRAULIC ENGINEERING:** Models of various dams and pictures of hydraulic developments. A special exhibit of the use of stabilized mud for earth houses.

**MILITARY ENGINEERING:** Included in the military engineers' exhibit is an exact model of a light (10 ton capacity) ponton bridge. Because time is of paramount importance in military river crossings, military engineers have developed standard floating bridge equipage, of which student engineers have a model. A company of engineers can place 1000 feet of this bridge across a river in from two to four hours. These bridges carry all divisional loads, of which the maximum is ten tons, and with reinforcing will carry fifteen tons safely.

Included in the exhibit are a trench type road mine capable of destroying any vehicle, and full size Concertina rolls, cylindrical spirals of wire, usually four feet in diameter and twenty feet long, which are extremely effective in stopping all wheeled vehicles. A set of demolition equipment complete with blasting caps, fuse, exploder, and T.N.T. is open for public inspection.

## MINING AND METALLURGY LABORATORY

Souvenir "Chinese Pennies," copper plated with "U. of I.," will be given to visitors. Heat treating machinery—furnaces, pyrometers, and quenching equipment will be on display.

See how your car fender, your aluminum kitchen utensils, and



"Five and Ten" jewelry appear under a microscope when magnified 150 diameters.

Among the mining demonstrations will be separation of ores by flotation, methods of determining the metallic content of an ore, mine ventilation, and safety lamps.

See the demonstration of electrical welding which now plays an important role in building destroyers, battleships, airplanes, and other armaments in the national defense program.

### LOCOMOTIVE LABORATORY

An Illinois Central mogul locomotive will be in operation almost continuously throughout the day. Several times during the show the engine will be put through its paces, *i.e.*, tractive effort and fuel consumption tests will be run. Here is an opportunity to see a locomotive operate at normal speed with full load and still not move an inch. Special testing equipment used in research work is also located here.

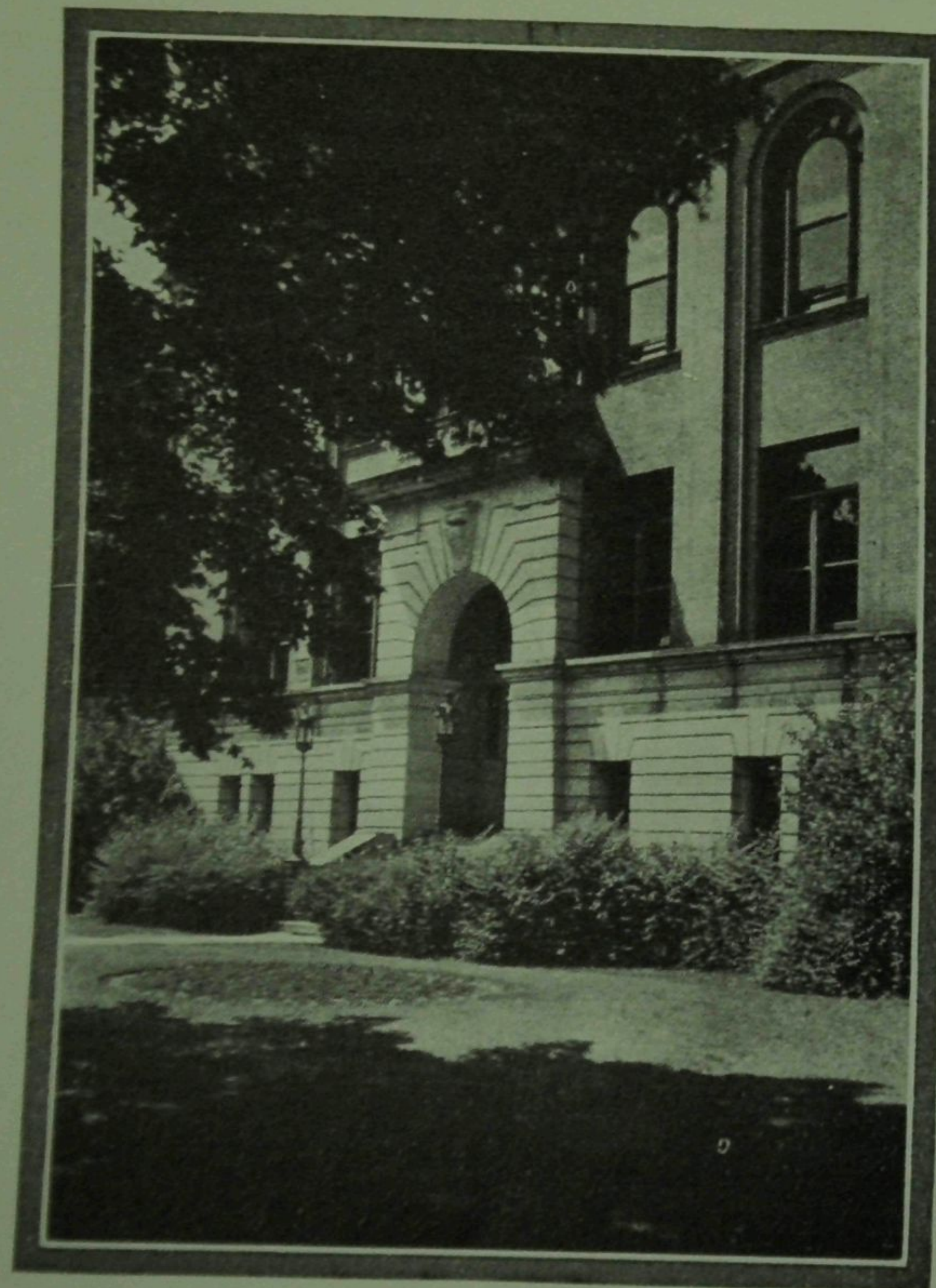
The specially equipped interurban electric test car can be moved under its own power for making tests of motor performance and rail bond condition. See also the 1000-horsepower, eighty-ton electric freight engine of the Illinois Terminal Railroad Company.

In the Brake Shoe Laboratory, adjacent to the Locomotive Laboratory,

is housed the steam engine, flywheel, and other equipment for testing freight car brake shoes under the most severe actual operating conditions. Tests can be run here at equivalent train speeds of more than 100 m.p.h.

Engineering Hall was one of the first engineering buildings to be erected on the University of Illinois campus. In this building is housed all of the College offices, and the main office of the Engineering Experiment Station. On the first and second floors may be found the Engineering Library.

Many engineering graduates carry fond memories of the hours spent in the pursuit of an education under the roof of this building. Engineering Hall serves as the center of many engineering student activities. The Illinois Technograph has its office here, and many Departmental Societies hold their meetings in its lecture rooms.



### CERAMICS BUILDING

KILN LABORATORY: Drying equipment; kiln firing; smelting enamels and frits; slagging test of refractories; crushing, grinding, and tempering of clays; brick making.

FIRST FLOOR: Metal enameling; production of ash trays; glaze preparation; clay testing; display of fine china and other ceramic products; pottery making.

SECOND FLOOR: Ceramic Museum; moving pictures in Room 218; research laboratories; demonstration of use of microscope in ceramic investigations.

### TRANSPORTATION BUILDING

FIRST FLOOR: Sections of various types and weights of steel rails, models of locomotive valve gears and standard car couples, railway signal and automatic block models.

THIRD FLOOR: Display of elementary drawings, advanced drawings, architectural projections, nomographs, and descriptive geometry.

Display of large size and attractively colored models of conic and cylindrical intersections.

Air-brush display and demonstration showing color, tone shading, rendering as applied to engineering.

Demonstration of various types of lettering pens, irregular curves, the pantograph, Wrico lettering aids, section liners, the ellipsograph, Universal drafting machine, beam compasses, and power erasers. A continuous demonstration of the reproduction of engineering drawings by the blue print, Van Dyke, ozalid, directo, photostatic, and zinc etching methods.

### POWER LABORATORY

Display of equipment used for laboratory instruction in mechanical engineering. Demonstration tests of belts, Corliss steam engine, Diesel engine, fan, automotive engine, smokeless furnace burning Illinois coal, oil-burning warm air furnace.

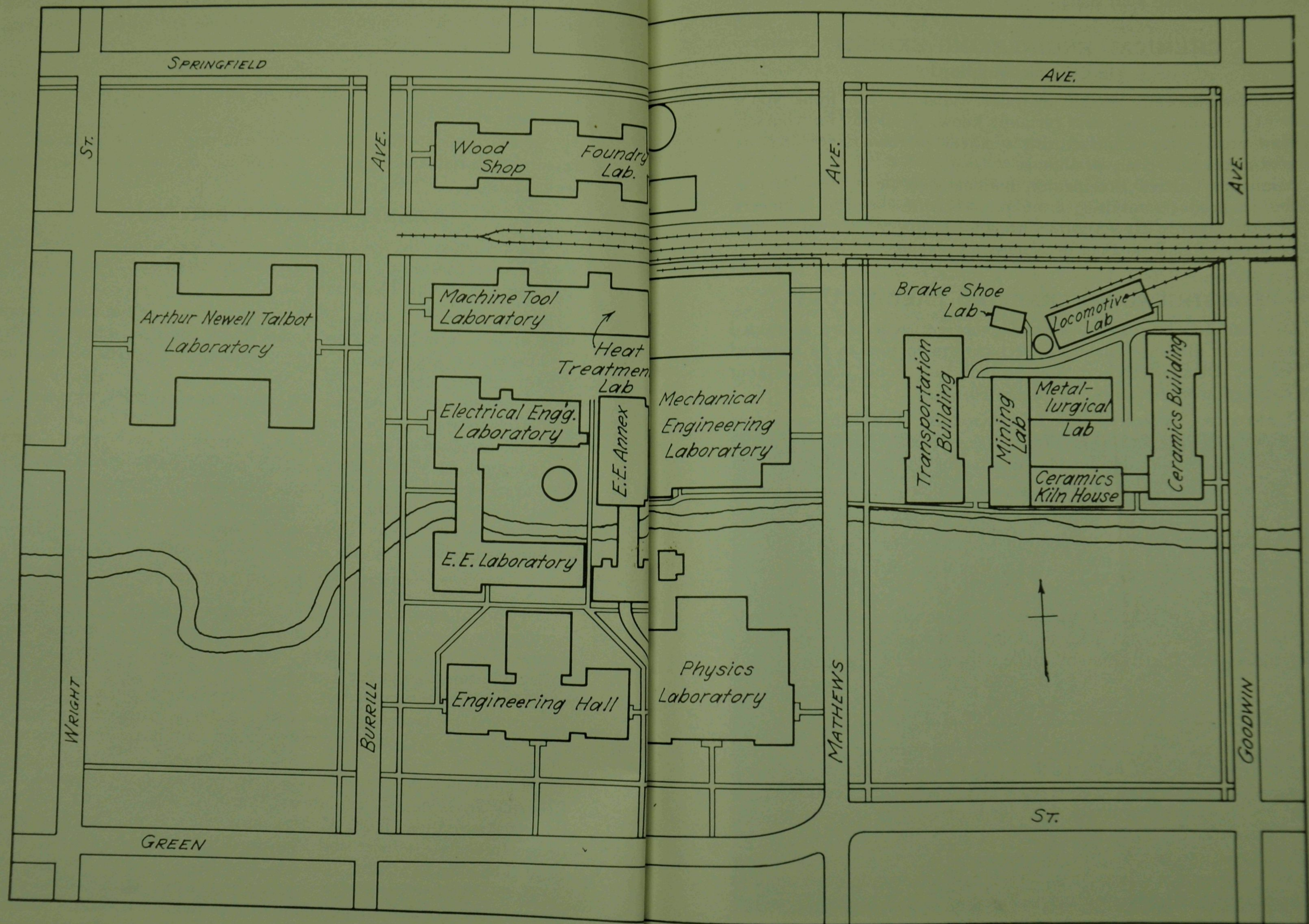
Complete experimental air conditioning unit in operation.

Displays of petroleum production methods, airplane engines and instruments, model home-size refrigeration unit, home heating research equipment.

In addition to laboratory equipment for home heating research, the Research Residence of the National Warm Air Heating and Air Conditioning Association, 1108 W. Stoughton St. and the Research Home of the Institute of Boiler and Radiator Manufacturers, 801 W. Green St. will be open to visitors 7-10 p.m. Friday and 1-5 p.m. Saturday.

In the Engineering Hobby Exhibit, hear tiny motors roar at speeds up to 11,000 revolutions per minute. See model airplanes capable of climbing 2000 feet per minute. See a model racer capable of traveling







80 miles per hour. Brake tests and static thrust tests will be run on motors smaller than your hand.

### CHEMICAL ENGINEERING EXHIBIT (in Ceramic Building)

The instantaneous human analysis! What do you think you're made of? Chemical engineers certainly know. Find out for yourself.

New process for manufacturing synthetic petroleum, recently discovered at the University of Illinois.

Miniature Cattrell Precipitator, national defense project, and an exhibit of products resulting from the work of chemical engineers.

Motion picture, "New World Through Chemistry," shown through the courtesy of E. I. du Pont de Nemours Company.

### ELECTRICAL ENGINEERING LABORATORY

DYNAMO LABORATORY: Alternating current generators connected in parallel as in power plants. Direct current motors to be operated by visitors. Demonstration of how an induction motor works without any connection to armature. "Floating Dishpan."

RADIO AND COMMUNICATION LABORATORIES: Television apparatus and radio receivers and transmitters in action. Application of radio testing equipment. Visible sound waves on the oscillograph.

ELECTRONICS LABORATORIES: Demonstrations of electronic tube control devices. Speech scrambler. Talking magnetic tape.

METER LABORATORY: Demonstration of power metering.

RELAY LABORATORY: Protective devices used on power and transmission lines.

HIGH VOLTAGE AND ILLUMINATION LABORATORIES: The Tesla Coil, which produces artificial lightning, is brought from the Electrical Show. Demonstration of modern commercial lighting; testing apparatus.

### ARTHUR NEWELL TALBOT LABORATORY

MAIN CRANE BAY: One 20" x 48" concrete cylinder will be tested every hour, on the half hour, in the 3,000,000-pound testing machine. See the machine at work testing welded joints used in building construction. Reinforced concrete slabs for bridge floors are being tested under concentrated loads in cooperation with the U. S. Bureau of Public Roads and the Illinois Division of Highways. Research apparatus for detection of cracks and fissures in steel rails (this work is for the purpose of preventing railroad wrecks caused by broken rails).

HYDRAULIC LABORATORY: Centrifugal pumps to furnish water for the hydraulic laboratory. Pumps, water motors and turbines, test

meters and other apparatus for the study of the flow of water, all in operation. Apparatus for the study of the flow of water through a glass pipe. Model of spillway for flood protection of dam near Centralia, Illinois.

SANITATION LABORATORY: Views of living microscopic organisms in water. Intermittent sand filter. Demonstration of agricultural value of sewage sludge.

MATERIALS LABORATORY: Testing machines and apparatus, for measuring the physical properties of materials, in continuous operation. Tension and torsion tests of steel, compression tests of wood, tests of cloth and wire, effects of temperature on the strength of steel, tests of stone, bituminous material and the bearing power of soils.

REPEATED STRESS AND PHOTOELASTIC LABORATORIES: See the laboratories devoted to repeated stress research and the metallographic study of fissures in rails; also the lead investigation. See the latest developments in photoelastic research. How do machine parts act when subjected to vibration?

SANITARY ENGINEERING: Model of a modern sewage treatment plant, demonstration of the use of sludge as a fertilizer, model of in-



ARTHUR NEWELL TALBOT LABORATORY



termittent sand filter equipped with dosing tank, microscopic views of living water organisms, and the extraction of water from the air.

CONCRETE LABORATORY: Demonstration and display of the instructional equipment for testing portland cement, aggregates, and concrete.

### MACHINE LABORATORY

See a gas engine so small that you can hold it in your hand while it operates at 5000 revolutions per minute, automatic screw machines, hand screw machines, engine lathes, drilling machines (operated by engineering students), and an eight-horsepower auto size gas engine made by students. See also the frozen motion of valve mechanisms (stroboscope).

### HEAT TREATMENT LABORATORY

See tool steel quenched from 2400 degrees Fahrenheit, so hot it would burn ordinary metal. Watch steel wire expand, contract, and harden in air as it passes through the critical temperature. Find out what happens to the structure of steel as it passes through each stage from the raw ingot to a finished gear.

### FOUNDRY LABORATORY

Get a souvenir Lincoln head paper weight in the Foundry Laboratory. Molten brass and aluminum melted in crucible will be poured every hour until evening. At 7:00 p.m. molten gray iron will flow from the cupola and be poured into sand molds.

See the welding of metals, the fabrication of machine parts by welding, and how easily steel may be cut with a torch.

### AGRICULTURAL ENGINEERING

(North of E. E. Building)

A trained farm tractor will cavort after the manner of an educated horse. Completely automatic, the tractor will guide itself over its favorite field in a methodical manner that puts old Dobbin to shame. All it asks is to be left alone while it plows, plants, cultivates, and harvests, in the best workmanlike manner.

Also featured by the Agricultural Engineering students will be working demonstrations of testing tractors for available belt horsepower and drawbar horsepower, a horse dynamometer for measuring the pulling power of teams (the official machine for the State of Illinois contests), soil conservation exhibits, and practical applications of building blocks made from local soil.

## Curricula Offered in Engineering

THE CURRICULA of the College of Engineering are extensive and varied and permit a wide range of choice as well as an opportunity for genuine specialization, particularly, in the realm of graduate work. Cultural subjects are interwoven with the theoretical and technical subjects of the several departments. The instruction of the classroom and the practice afforded by the library, the drafting room, and the laboratory, are thoroughly correlated. Throughout the course, the students work on problems and proceed by methods similar to those arising in the experience of the practicing engineer. The curricula in engineering are as follows:

1. Curriculum in Agricultural Engineering, with Options in Machinery and Power, and in Construction and Drainage.
2. Curriculum in Ceramic Engineering, with an Option in Ceramic Engineering Administration.
3. Curriculum in Ceramics (Designed especially for ceramic chemists).
4. Curriculum in Chemical Engineering (Administered in the College of Liberal Arts and Sciences).
5. Curriculum in Civil Engineering, with Options in Highway, Hydraulic, Railway, Sanitary, and Structural Engineering.
6. Curriculum in Electrical Engineering, with Options in Electrical Power Machinery and in Communications.
7. Curriculum in Engineering Physics.
8. Curriculum in General Engineering.
9. Curriculum in Mechanical Engineering, with Options in Petroleum Production Engineering and Railway Mechanical Engineering. (Emphasis is given to Refrigeration, Aeronautics, Heating and Ventilation, and Heat Engines through technical electives in the regular curriculum.)
10. Curriculum in Metallurgical Engineering.
11. Curriculum in Mining Engineering, with Options in Coal Mining, Ore Mining, Mining Geology, and Mine Administration.

Additional information will be supplied on request.

Dean—Melvin L. Enger, 106 Engineering Hall  
Associate Dean—Harvey H. Jordan  
300 Engineering Hall



# FEATURE EXHIBITS

**You can't afford to miss these!**

1. Every hour, on the half hour, a concrete cylinder will be tested to destruction in the 3,000,000-pound testing machine, the world's second largest. In the Materials Testing Laboratory main crane bay.

2. Kilns will be fired continuously in the Ceramics Building and brick making will be demonstrated and explained.

3. A full sized locomotive traveling at normal speed and yet not moving an inch may be seen throughout the day.

4. Don't miss the gas engine so small that it can be held in one hand while it is running at 5000 revolutions per minute in Machine Tool Laboratory.

5. Every hour during the afternoon you will be able to see molten metal being poured and will be presented with a Lincoln head souvenir. Foundry.

6. In Engineering Hall can be found a model of a "clover leaf" highway intersection, complete in every detail. Learn where to turn.

7. Frequent exhibits of direct current high voltage corona discharges may be witnessed in the Electrical Engineering Annex.

8. In the Mechanical Engineering Laboratory be sure to see the air conditioning apparatus in operation.

9. Be sure to see the steel being quenched in the Heat Treatment Laboratory.

10. See frequent demonstrations of new types of lighting equipment and methods in the Illumination Laboratory.

11. Continuous showing of motion pictures of Tacoma Narrows Bridge failure, in 319 Engineering Hall.

12. Ingenious spiral farming demonstration north of the Electrical Engineering Laboratory.

---

**I.S.E.E. HEADQUARTERS · · 106 ENGINEERING HALL**

University Phone—6131

For information, guides, lost and found, bureau of missing persons, etc., inquire in this room. Also see I. S. E. E. officials at any part of the show.

First aid for injuries will be given at the University Health Station on the Corner of Wright and Green Streets. In case of emergency call 7-1821 or U 2147.